

038 Series OPTICAL TRACKBALLS IP68 Sealing



USB, PS/2 and Quadrature Outputs

- Solid State Optical Navigation Technology
- . Totally Waterproof (IP68)
- ESD Protected (Impenetrable Barrier)
- Adjustable Friction Control
- Fixed and Removable Ball Versions
- Self-draining/back flushing Models
- OEM Custom Resolutions
- . Decontamination Friendly



• SPECIFICATIONS

<u>Mechanical</u>							
Weight	nt 120 grams						
Ball	Epoxy Resin, 38.10 mm						
Tracking Force	5 grams Nominal Continuous Free Running						
	20 grams Nominal Continuous Friction / Scraper Ring						
	- 200 grams Nominal Continuous Variable Friction Ring/Removable Ball						
Ball Load	>300N Maximum downward pressure (30 Kg) for 2 mins.						
Ball Rotation	Continuous and reversible any direction						
Resolvable Ball Speed	14.4 Inches/sec.						
Housing Material	Polycarbonate (Lexan®LS2 lens grade)						
Transducer	Optical Navigation Technology (solid state sensing)						
Mounting Position All angles (Dependant on top plate arrangement)							
<u>Electrical</u>							
Standard Output Connecto	or JST style, 2mm Pitch, PH series 10 way right-angled header						
Mating Connector	JST style, 10 way CR, KR or KRD type connector JST part no: PHR 10						
Resolution (Quadrature)	314 / 157 pulses per ball revolution, switchable (custom resolutions available)						
Resolution (Protocol mode	 1256 pulses per ball revolution (custom resolutions available) 						
External Switch Inputs	3 switches Left, Middle, and Right. Connection through JST, 2 mm pitch, 4-way						
	right-angled header. Mating part no: PHR 4						
Supply Voltage	3.6V to 5.5V						
Supply Current	110mA typical						
	150mA maximum						
Environmental							
Operating Temperature	0°C to +55°C *						
Storage Temperature	-25°C to + 85°C *						
ESD	>15kV air discharge and 8 kV contact fully protected						
Impact	10 Joules						
Lifetime	> 1 million ball revolutions						
Sealing Capabilities	lp68						
* Rating of most sensitive	components.						

All specifications nominal at 20°C except where stated

• **DIMENSIONAL DRAWING**

Dimensions for free running and fixed friction/scraper devices



DIMENSIONAL DRAWING

Dimensions for Variable Friction / Removable Ball device



• DIMENSIONAL DRAWING

Connections are made to the O38 series unit by means of two latching JST (or equivalent) connectors.

Connector 1A: - Quadrature, USB and PS/2 protocols. **Connector 2A: -** Switch Inputs.

Output Connector 1A

Pin Number	Quadrature output	USB Output	PS/2 Output	
1 2	X1 output X2 output	-	-	
3	Y1 output	-	-	
5	-	-	_	
6	-	-	-	
7	Vcc Supply	Vcc Supply	Vcc Supply	
8	-	D-	PS/2 Data	
9	-	D+	PS/2 Clock	
10	GND	GND	GND	

External Switch Input Connector 2A

Pin number	Function			
1 2 3 4	Left Switch Middle Switch Right Switch GND			

Switch Schematic



• OPTIONAL LEAD ASSEMBLIES

Standard Lead assemblies for connection to the O38 unit are available (See table 1). Other lead assemblies can also be supplied to customer specifications.

PS/2, USB						
Cursor Controls Part Number	Leads / Adapters	Description				
T9902128 T9902147 T9902125 A3900126	Output cable USB Output cable PS/2 Switch Input Interconnection	10 way JST - USB type A, 2.2 meters long 10 way JST style - PS/2, 2.2 meters long 4 way JST style - bare wires, 35 cm long Interconnection cable, 35 cm long				

Table1. Lead assemblies and	adapters for connection to device
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• **CONFIGURATION**

The 8-way dipswitch, located on the underside of the unit, provides the user with optional configuration features. These are detailed in table 2.

Table 2: DIP Switch functionality (Universal Interface)

Universal interface PS/2, USB						
Switch	Function	Off	On			
1 2 3 4 5 6, 7, 8	Orientation 1 setting Orientation 2 setting VX3 - Virtual 3 axis function Ballistic Mode Inverted Y	See diagram (fig 1) See diagram (fig 1) Feature Enabled Feature Enabled Feature Disabled Default	See diagram (fig 1) See diagram (fig 1) Feature Disabled Feature Disabled Feature Enabled			

Factory default setting: Switches 1,2, and 3 ON

Table 3: DIP Switch functionality (Phase Quadrature)

Phase Quadrature						
Switch	Function	Off	On			
1 2 3	Orientation 1 setting Orientation 2 setting N/A	See diagram (fig 1) See diagram (fig 1) Default	See diagram (fig 1) See diagram (fig 1)			
4 5	Resolution Inverted Y	314 pulses per revolution Feature Disabled	157 pulses per revolution			
6, 7, 8	N/A	Default	Feature Enabled			

Factory default setting: Switches 1 and 2 ON

Switches 1 and 2: Orientation settings

Switches 1 and 2 allow four possible mounting orientations for the Trackerball (See figure.1)



Figure.1 Mounting Orientations

Switch 3

VX3: is a patent protected facility that provides the same 2 modes of function as a scroll wheel on a 3-axis mouse. This feature is disabled by default and must be enabled by setting dip switch 3 before use.

Operation:

Press middle button once to latch scroll mode one (e.g. dynamic pan feature); Press middle button again to latch scroll mode two (e.g. 3rd axis zoom feature); Further middle button presses toggles between scroll mode one and scroll mode two; Press either left or right buttons to cancel feature and resume normal X-Y operation.

Switch 4

Ballistic Mode: Simulates cursor acceleration under fast ball movement. (Enabled by default)

Switch 5

Inverted Y: Y-axis is inverted for overhead operation.

<u>Switch 6, 7 & 8</u>

Switch functions not used.

STANDARD PRODUCT OPTIONS

Product Ordering Code **O38 XXXXXX**. Please construct your standard product ordering code by selecting the numbers and letters to suit your specification.

	0	38	-	X	X	X	X	X	X
Product Range O= Optical									
Ball Size (nominal mm)									
Sealing Capabilities 7 = IP68/Nema4									
Electrical Output 0 = Quadrature 6 = USB/PS/2									
Integrated Switches 0 = No Switches									
Mounting Option 2= Panel									
Top Plate, Body Style 0 = Free Running 1 = Friction/Scraper Ring 4 = Variable Friction/Ref 5 = Free Running, Self-I 6 = Friction/Scraper Ring 7 = Variable Friction/Ref	g movable B Draining g, Self-Dra movable B	all aining all, Self-D	raining						
Ball Colour A = Metallic Charcoal (n D = Metallic Light Grey (on-standa (standard)	rd)							

Ordering Example O38-70020D :

Optical 38mm, IP68, phase quadrature only, no switches, panel mounted, free running, metallic light grey ball.

• OPTIONAL EXTRAS

- Anti-Vandal Option.
- Self-Draining Facility
- Optional Ball Colours (MOQ applies)
- Customer Specific Colour Matching (MOQ applies)
- Lead Assemblies

Contact your local distributor for further details on product variants and custom specifications.



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